## WHAT IS THE MONTANA DIABETES PROJECT AND HOW CAN WE BE CONTACTED:

The Montana Diabetes Project is funded through a cooperative agreement with the Centers for Disease Control and Prevention, Division of Diabetes Translation (U32/CCU815663-04). The mission of the Diabetes Project is to reduce the burden of diabetes and its complications among Montanans. Our web page can be accessed at http://ahec.msu.montana.edu/diabetes/default.htm.

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MONTANA DIABETES SURVEILLANCE & CLINICAL COMMUNICATION

MONTANA DIABETES PROJECT

**Montana Department of Public Health and Human Services**
**Chronic Disease Prevention and Health Promotion Program**
**Room C317, Cogswell Building**
**PO Box 202951**
**Helena, Montana 59620-2951**

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**ISSUE: OCTOBER-DECEMBER 2001**


## PREVENTING TYPE 2 DIABETES: BELIEFS AND PERCEPTIONS OF RISK AND PREVENTION AMONG ADULTS AGED 45 YEARS AND OLDER.

### WHAT'S INSIDE



## BACKGROUND:

The prevalence of diabetes is increasing in both the United States and in Montana.[1,2] In Montana the prevalence of diabetes increased 26% in the years 1994-1999 compared to 1988-1993 based on data from the Montana Behavioral Risk Factor Surveillance System, and the prevalence of obesity and overweight also rose dramatically over the past decade.[2,3] These increases pose a health hazard to Montana communities. Diabetes is a leading cause of amputation, blindness, and kidney failure, and has been recently defined as a coronary heart disease equivalent (e.g., having diabetes is equivalent to having existing heart disease) in the latest National Cholesterol Education Program (NCEP) guidelines.[4] Both insulin resistance and a relative failure of insulin secretory capacity characterize type 2 diabetes.[5] Insulin resistance, which is often accompanied by hypertension and dyslipidemia before diabetes develops, places individuals at risk for diabetes and cardiovascular disease.[6] Therefore, modifying insulin resistance through positive lifestyle changes in individuals at risk for type 2 diabetes and cardiovascular disease presents a very important public health opportunity.[7,8]

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Recent prospective studies have proved that lifestyle changes with improved diet, increased physical activity and modest

weight loss can prevent type 2 diabetes. A randomized controlled clinical trial in Finland showed a 58% decrease in the incidence of type 2 diabetes when lifestyle interventions were conducted in high-risk subjects (Figure 1).[9] In August 2001 the Department of Health and Human Services announced the results of the Diabetes Prevention Program, a multi-center study to compare lifestyle and medications in individuals at high risk for type 2 diabetes.[10] The risk of developing diabetes among those in the lifestyle arm of the study was also decreased by 58% (Figure 1). The lifestyle intervention included moderate physical activity of 30 minutes per day and a 5-7% weight loss over the 3-year period. Metformin also decreased the risk of progression to diabetes by 31%. Retrospective studies have also concluded that many of cases of diabetes could be prevented by the adoption of a healthier lifestyle.[11] And a new ICD–9-CM code has recently been adopted for the Dysmetabolic Syndrome X in order to identify individuals with the insulin resistance syndrome.[12]

Implementing diabetes prevention interventions in the general population presents several challenges. Little is known about the perceptions about diabetes prevention among persons at risk for diabetes. Health care providers may be more accustomed to counseling patients about heart disease risk than about diabetes prevention. This report describes self-reported information from a survey of adults aged ≥45 from two rural communities in Montana and describes associations between risk factors for type 2 diabetes and perceptions about diabetes prevention and risk. It also examines associations between risk factors and medical advice regarding diabetes risk.

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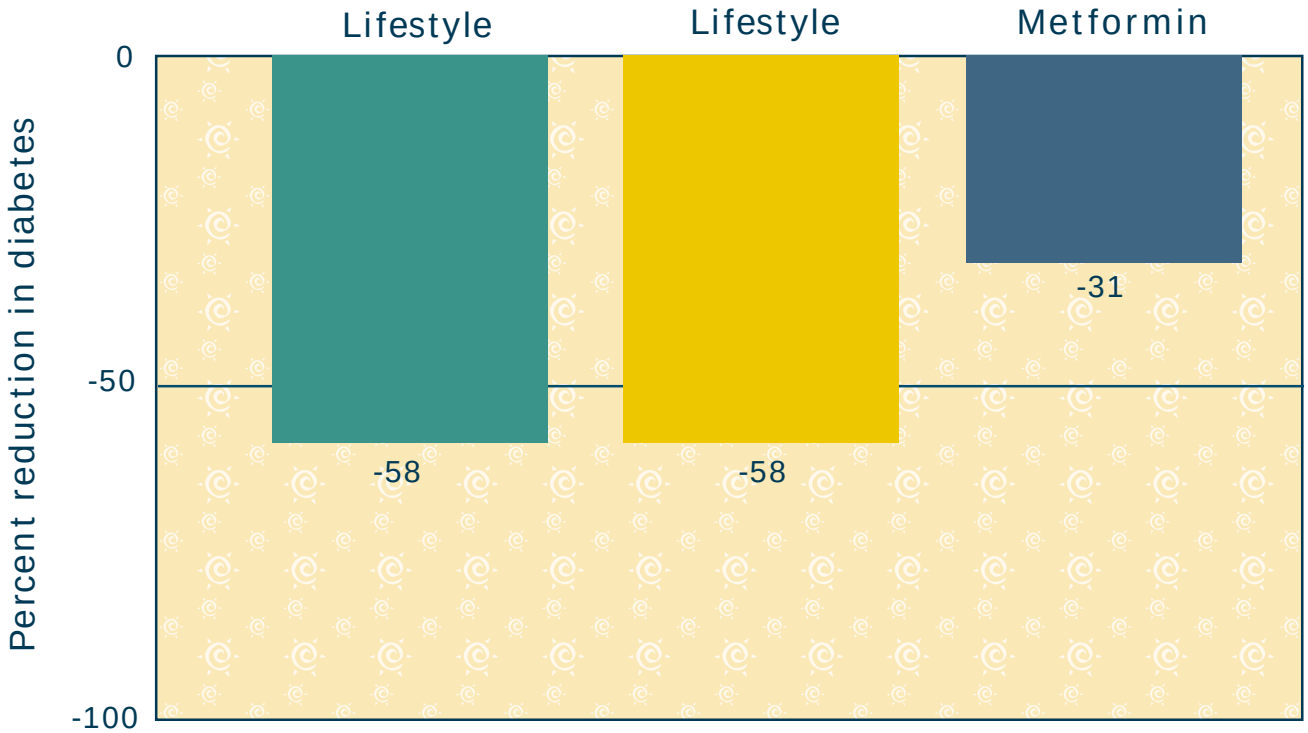
From November 2000 through January 2001, the Montana Department of Public Health

Figure 1. Percent reduction in the development of diabetes in the Finnish study and the Diabetes Prevention Program.



and Human Services conducted a telephone survey of Montanans aged ≥45 years who were living in two rural counties. The 1997 population of the two counties was 28,858, and more than 97% of the residents were white. Briefly, respondents were asked if they had ever been told by a physician they had diabetes, including gestational diabetes; if they had a family history of diabetes (sister, brother or parents), and if they had ever been told they had high cholesterol and/or high blood pressure. Each respondent was also asked to state his or her height and weight. Respondents without a previous diagnosis of diabetes (excluding gestational diabetes) were asked, "Do you think you are at risk for diabetes?," "Do you think that you can prevent getting diabetes?," and "Has a doctor or other health professional ever told you that you may be at risk for developing diabetes?" A Body Mass Index (BMI) was calculated based on the person's self-reported height and weight. Respondents with a BMI between 25.0 and 29.9 were defined as overweight, and respondents with a BMI ≥30.0 were defined as being obese. The following variables were used to define the number of risk factors for each respondent: age ≥45 years; family history of diabetes; history of gestational diabetes; overweight; history of high blood pressure; and history of high cholesterol. Because dyslipidemia and hypertension are associated with the dysmetabolic syndrome, we used a history of "high cholesterol" and a history of "high blood pressure" to indicate the "possible" presence of insulin resistance. [12] Individuals were then categorized as having one, two, or three to six diabetes risk factors.

Pearson Chi square tests were used to assess associations between the perceived risk for diabetes, perceived ability to prevent diabetes, and medical advice regarding diabetes risk. Logistic regression analyses were conducted to identify independent variables associated with perceived risk for diabetes, perceived ability to prevent diabetes, and medical advice regarding risk. Odds Ratios (OR) and 95% confidence intervals were calculated.

Six hundred and five people were reached by telephone. Twenty-nine (4.8%) respondents reported that they had diagnosed diabetes; this group was not included in the analyses. Five hundred seventy-one (94.4%) of the respondents reported that they did not have diagnosed diabetes. Five additional women (0.8%) reported a history of gestational diabetes only; this group was included in the analyses. The majority of respondents who said they did not have diabetes were female (60%) and the mean age was 60 years (maximum age 97 years). Thirty-eight percent of those who said they did not have diabetes reported a family history of diabetes, 49% were overweight, 14% were obese, 26% reported having high blood pressure, and 28% reported having high cholesterol.

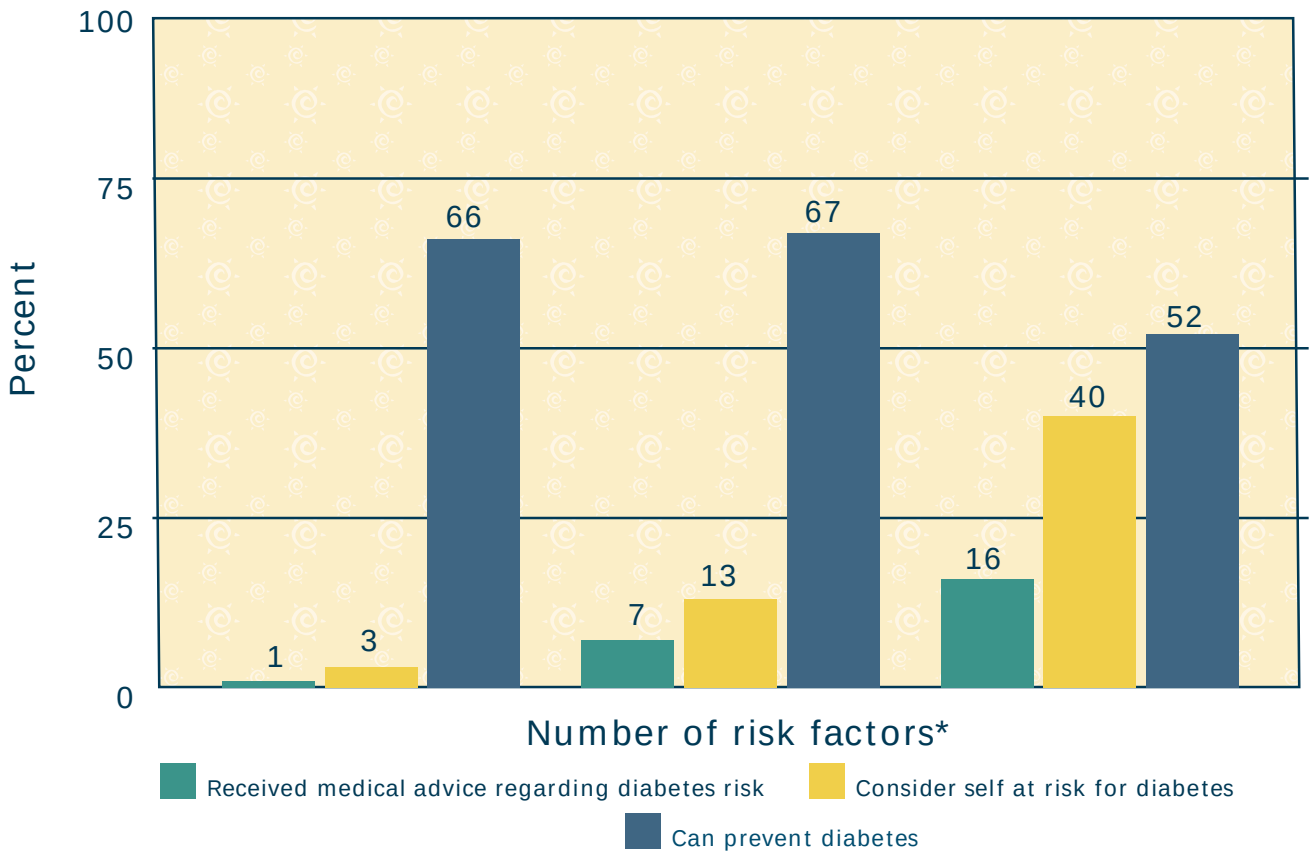
Twenty-two percent of the respondents considered themselves at risk for diabetes, 71% did not consider themselves at risk, and 7% were unsure. Sixty percent thought they could prevent diabetes, 17% did not and 23% were unsure. Only 10% of respondents reported receiving medical advice regarding diabetes risk and 90% did not.

Including age ≥45 years as a risk factor, 20% of respondents had one factor suggesting a risk for diabetes, 37% had two factors and 43% had three to six factors. Persons with three or more factors were more likely than persons with fewer than three risk factors to consider themselves to be at risk for diabetes (P<.001) (Figure 2). However, persons with three or more risk factors were less likely than persons with fewer than three risk factors to feel that they could prevent diabetes (P=.002). Respondents with three or more risk factors were also more likely than those with fewer than

three risk factors to recall medical advice from a health professional regarding diabetes risk (P=.001).

The probability of considering oneself at risk for diabetes was higher among respondents who were aged 45 to 64 years, were female, had high blood pressure, and had a family history of diabetes (Table 1). Persons aged 45 to 64 years also were more likely than older respondents to feel they could prevent diabetes. Persons with high blood pressure, persons with high cholesterol and persons with a family history of diabetes were less

Figure 2. Percentage of repondents who had ever received medical advice regarding diabetes risk, considered themselves at risk for diabetes and perceived that they could prevent getting diabetes by number of risk factors for diabetes.




*Risk factors include age ≥45 years, overweight (BMI ≥25.0 kg/m$^2$), told have high blood pressure, told have high cholesterol, family history of diabetes and gestational diabetes.

likely than persons without these characteristics to feel they could prevent diabetes. Women, obese respondents, those with high blood pressure, and those with a family history of diabetes were more likely than the corresponding comparison groups to have received medical advice from a health professional regarding diabetes risk.

After adjusting for multiple risk factors, the following characteristics were independently associated with respondents considering themselves at risk for diabetes: younger age (OR 2.59; 95% CI 1.51-4.46); high blood pressure (OR 1.93; 95% CI 1.16-3.23); family history of diabetes (OR 6.65; 95% CI 4.17-10.61); and overweight (OR 3.81; 95% CI

Table 1. Characteristics and risk factors among respondents aged 45 years and older who consider themselves at risk for diabetes, who perceive they can prevent getting diabetes, and who have received medical advice regarding diabetes risk.

| | Consider self at risk for diabetes | Can prevent getting diabetes | Received medical advice regarding diabetes risk |
|---|---|---|---|
| TOTAL | 22 | 60 | 10 |
| AGE (YEARS) | | | |
| 45-64 | 26* | 63* | 10 |
| ≥65 | 15 | 54 | 9 |
| SEX | | | |
| Male | 18 | 57 | 6 |
| Female | 25* | 63 | 12* |
| BMI | | | |
| Obese | 41* | 66 | 21* |
| Overweight | 25 | 56 | 10 |
| Not Overweight | 9 | 63 | 6 |
| HIGH BLOOD PRESSURE | | | |
| Yes | 33 | 52 | 14* |
| No/Unknown | 19 | 63* | 8 |
| HIGH CHOLESTEROL | | | |
| Yes | 27 | 49 | 9 |
| No/Unknown | 21 | 65* | 10 |
| FAMILY HISTORY OF DIABETES | | | |
| Yes | 42* | 55 | 20* |
| No/Unknown | 10 | 64* | 3 |

2.34-6.20). Men were less likely than women to consider themselves at risk (OR 0.53; 95% CI 0.33-0.87). Respondents with high blood pressure (OR 0.80; 95% CI 0.35-0.79), high cholesterol (OR 0.52; 95% CI 0.34-0.78), and a family history of diabetes (OR .65; 95% CI .45-.93) were less likely than those without these characteristics to feel they could prevent diabetes. Respondents with a family history of diabetes (OR 6.42; 95% CI 3.27-12.62), and those who were overweight (OR 2.28; 95% CI 1.22-4.29) were more likely to report having received medical advice regarding diabetes risk. Men compared to women, however, were less likely to recall medical advice regarding diabetes risk (OR 0.46; 95% CI 0.23-0.90).

## CONCLUSIONS

With the recent studies showing that type 2 diabetes can be prevented in those at high risk, it has become very important to understand perceptions about diabetes risk and prevention. People must perceive that they are at risk for type 2 diabetes and believe that behavior change can prevent diabetes before they will initiate and maintain positive diet and exercise changes or use prophylactic medication. It is striking that a family history of diabetes was most strongly associated with an individual's perceived risk, but those with a family history were less likely to believe that diabetes was preventable than those without a family history.

Similarly, those reporting several risk factors for diabetes were less likely to perceive that diabetes was preventable than those with fewer risk factors.

Several limitations should be considered when interpreting the study findings. First, the survey was conducted by telephone and does not necessarily reflect the perceptions of individuals living in homes without telephones. And the findings rely on what people recall. Although we used a history of "hypertension" or "high cholesterol" to identify people with the insulin resistance syndrome, not all people who can recall these diagnoses were necessarily insulin resistant and at risk for diabetes. None theless, it is likely that more respondents in our study were at high risk for diabetes than those that could recall receiving medical advice about their personal diabetes risk. With the positive results of the Diabetes Prevention Program (i.e., lifestyle or pharmacologic therapy are effective interventions), the primary care and public health communities are faced with the challenge of "translating" prevention strategies into widespread community practice. Of particular interest is the finding that few respondents in this small survey reported receiving medical advice from health professionals regarding diabetes risk. This survey suggests that widespread translation of the findings of type 2 diabetes prevention trials will require changing the beliefs about primary prevention in those at highest risk for diabetes, as well as promoting diabetes prevention in busy primary care practices.

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## ACKNOWLEDGEMENTS:

We would like to thank the staff members of Northwest Resource Consultants for their expertise and work on the telephone survey.

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## CME OPPORTUNITIES FOR PROVIDERS

Listed below are selected sites where physicians and other health professionals can obtain continuing medical education credits related to diabetes. We will post other CME listings in the future. If you would like to add listings please contact Marci Butcher at 406-444-6677.

| | |
|---|---|
| National Diabetes Education Initiative | www.ndei.org |
| Medscape: | www.medscape.com |
| Doc Guide: | www.docguide.com |
| Lipid Health: | www.lipidhealth.org |
| Lipids Online: | wwwlipidsonline.org |
| Hypertension Online | www.hypertensiononline.org |